

Translation of French Patent Document No. FR 2,364,289

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Priority Date: Sweden, September 9, 1976; No. 76 09972-0

Int. Class: D21 B 1/30

Application Date: June 6, 1977

Publication Date: April 7, 1978, B.O.P.I. "Listes"

Original French Title: Perfectionnements apportés aux dispositifs pour la raffinage des matériaux en fibres.

IMPROVEMENTS MADE TO DEVICES FOR REFINING FIBER MATERIALS

The present invention relates to dual-disk refiners for processing fiber flock. Refiners of this type comprise two refining disks which rotate in opposite directions and which allow the material to be refined as it passes through the space separating the disks. The fiber material is passed in the form of fiber flocks through openings arranged near the center of one of the refiner disks.

During the processing operation, large quantities of vapor are generated, and a certain quantity of this vapor exits the refiner with the refined material. However, a large portion of the vapor flows back upstream of the refiner toward the inflow of the fiber flocks to be refined. This circulation of vapors may interfere with feeding the fiber flocks and

cause the flocks to be non-uniform, and this causes the refined product to be non-uniform as well.

In general, feeding fiber flocks is usually accomplished by means of a worm of the like, which rotates at a constant speed and thus delivers the material to be refined toward the openings in a refining disk. The feed speed is therefore low, usually on the order of 2 m/sec, and moreover, the cross-section of the passage provided for the feeding process is very small and the flow of vapor upstream of the refiner may interfere with feeding the fiber flocks.

It is therefore the object of the present invention to resolve this problem with the help of a special device, which is designed in such a way as to impart higher speed to the flock fiber to be refined during the feeding process through the openings in a refiner disk. As the result of this high speed at which the material to be refined is projected toward the openings in the refining disk, feeding the fiber flocks is not interfered with, and a uniform discharge of the material to be refined can be maintained.

The invention therefore relates to a device for refining fiber materials in the form of fiber flocks which comprises two counter-rotating refining disks, with one of the disks being provided with an opening situated near the center and for the purpose of feeding the fiber flocks in the space between

the disks and a feed hopper for guiding the fiber flocks toward said opening, with the device being characterized in that in the lower portion of the feed hopper a rotor is provided with blades arranged in such a way as to project the fiber flocks at high speed into the opening in the refining disk.

Other characteristics and advantages of this invention will become apparent upon perusal of the specification below and the accompanying drawings of an exemplary embodiment and in which:

Figure 1 is a schematic view of a duel-disk refiner in accordance with the invention, and

Figures 2 and 3 are two views of the portion of the device comprising the feed means.

Two counter-rotating refiner disks 1, 2 are arranged on a shaft 3, 4, respectively, with the shafts being driven individually by motors (not illustrated). The bearings 5, 6, which are situated as closely as possible to the refiner disks, are visible in Figure 1. A housing 7 for receiving and collecting the material is mounted around disks 1, 2; after refining, the material flows out of the space between the refiner disks, with disk 1 in the exemplary embodiment being provided near its center with openings 8 for the purpose of feeding the material to be refined. Directly opposite these openings 8, the housing 7 opens toward the shaft 3 and is connected to a

feed hopper 9 for guiding the material to be refined toward the opening of the housing. The hopper 9 is provided with a vapor separator 10 in which the material to be refined falls through a conduit 11 and in which the vapor passes along the side of the conduit 11 and exits through an opening 12 provided on the upper surface of the vapor separator 10.

In the lower portion of the hopper 9, a rotor 13 is provided which is mounted to rotate about a horizontal shaft 14, which rotates at a high speed. The rotor 13 comprises a certain number of radial arms 15 which are provided with blades or paddles 16. The rotor is usually open, and as a consequence, the vapor is allowed to flow toward the back (i.e., upstream). Four blades 16 may be provided whose outside edge may be provided with teeth. Between the rotor 13 and the opening 8 of the refining disk 1, a free passage is arranged for the material to be refined. The latter, being driven by a rotor 13 by means of the hopper 9, is projected by the rotor as a result. The speed of the projection is on the order of 10 to 30 m/sec., preferably on the order of 15 to 25 m/sec. Due to the high speed of the material, and taking into consideration that the material never completely fills the space opposite the openings 8, the vapor can flow toward the back, i.e., upstream) without interfering with the discharge of the material to be refined. After

having penetrated the opening 8, the fiber flocks of this material are subjected to centrifugal forces, and advance between disks 1 and 2.

The quantity of the fiber flocks must be delivered and determined by the feed means (not illustrated) and situated upstream of the rotor in conduit 11. These means may be, for example, made of a feed channel. As an alternative, the material to be refined may be routed toward the rotor 13 by a conveying worm.

In order to prevent any risk of clogging or jamming the lower portion of the hopper 9, it might be useful, in certain cases, to arrange two rotors 13 in series in this lower portion. Another modification of this invention may combine the afore-described device with the object of the French application filed the same day as the present application by the present applicant and entitled "*Dispositif pour le raffinage et matériaux en fibres*" (Device for Refining Fiber Materials).

It will be understood that the present invention is not limited to the afore-described and illustrated embodiments but may encompass any variants thereof.

CLAIMS

1. Device for refining fiber materials in the form of fiber flocks which comprises tow counter-rotating refining disks, with one of said disks (1) being provided with an opening (8) situated near the center and for the purpose of feeding the fiber flocks in the space between the disks and a feed hopper (9) for guiding the fiber flocks toward said opening, with the device being characterized in that in the lower portion of the feed hopper (9) a rotor (13) is provided with blades (16) arranged in such a way as to project the fiber flocks at high speed into the opening (8) in the refining disk (1).

2. Device as defined in Claim 1, characterized in that a conduit (11) is arranged above the rotor (13), with the fiber flocks falling through said conduit, toward the rotor (13) at a uniform output.

3. Device as defined in Claim 1, characterized in that a screw conveyor is provided in order to advance the fiber flocks toward the rotor (13).

4. Device as defined in one of Claims 1 to 3, characterized in that the rotor (13) comprises a certain number of radial arms (15) lined with blades and having the shape of plates arranged radially and positioned on the outside end of said arms.

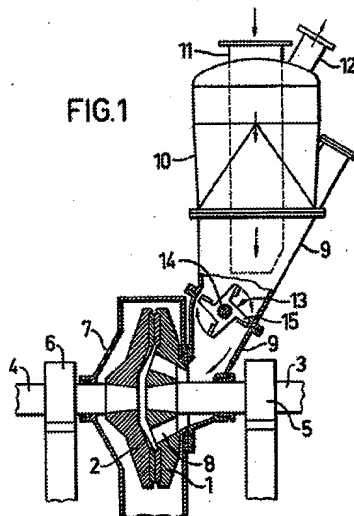


FIG.3

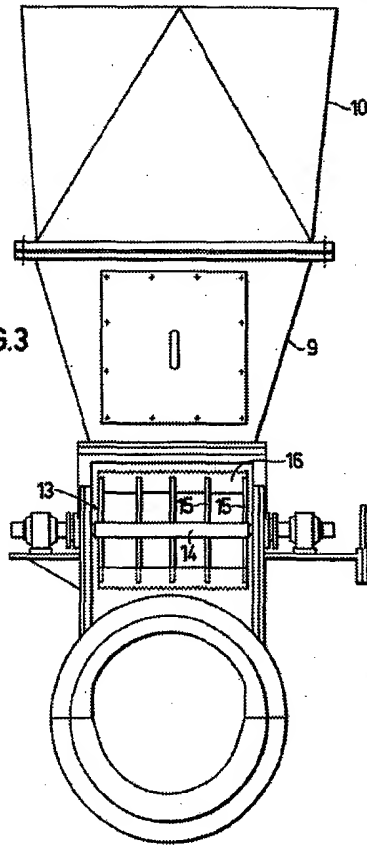


FIG.3

